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catua, the largest genus, fourteen species are recognized, and four additional subspecies are casually mentioned, although the latter seem worthy of a more prominent place. The second subfamily contains only the single species *Calopsittacus novæhollandiæ*. The two plates depict nine species.

Altogether, these first five parts of 'Genera Avium' are very creditable. The arrangement is good, the exposition clear, and while not so ample as some might wish, is yet probably sufficient for the purpose of the publication. The letter press is quite attractive in appearance; and the plates, all of which are colored, are excellent. This work will prove very useful to all who wish to keep abreast of the times, and will be well-nigh indispensable to the working ornithologist.

HARRY C. OBERHOLSER.

SCIENTIFIC JOURNALS AND ARTICLES.

The American Journal of Science for October contains the following articles:

A. L. DAY AND E. S. SHEPHERD: 'Lime-Silica Series of Minerals,' with optical study by F. E. Wright.

O. C. FARRINGTON: "Analysis of 'Iron Shale' from Coon Mountain, Ariz."

N. T. BACON: 'Phenomena Observed in Crookes' Tubes.'

I. BOWMAN: 'Northward Extension of the Atlantic Preglacial Deposits.'

H. C. BRADLEY: 'A Delicate Color Reaction for Copper, and a Microchemical Test for Zinc.'

A. HILEMAN: 'Elimination and Alkalimetric Estimation of Silicon Fluoride in the Analysis of Fluorides.'

C. BARUS: 'Note on the Actual Drop of Pressure in the Fog Chamber.'

C. BARUS: 'New Method for Standardizing the Coronas of Cloudy Condensation.'

DISCUSSION AND CORRESPONDENCE.

STEPHENS'S CALIFORNIA MAMMALS.

IN no part of the world is the effect of segregation and isolation as a factor in species-forming more evident than in California. No other state of our union offers such diversities of physical conditions, or such a variety of barriers to the dispersion of animals. A faunal map of California has been compared

to a crazy quilt, because any such map must recognize the limiting and modifying effects of the different sets of environment connected with the hills, valleys, mountains, lakes and streams of this varied land.

Because of the varying degrees of segregation produced by barriers of mountain and climate, the non-migratory animals of California are especially numerous in species, and many of the recognized species are broken up into numerous subspecies. Each form finds its nearest ally farther on, across the range; and, again, types once differentiated may invade each other's territory, when conditions enable individuals to cross the border.

In a volume called 'California Mammals' (West Coast Publishing Company, San Diego), Mr. Frank Stephens, of San Diego, has brought together compact descriptions of all the mammals thus far recorded from California. The descriptions are carefully written, the accounts of habits are full and accurate, the volume is well printed, and it can not fail to be of great value to the students of California beasts. Two hundred and seventy-six species and subspecies are included in the list. The volume contains also an excellent essay on the 'Life Areas of California.' Under the head of *Homo sapiens americanus*, the most specialized of the indigenous mammals of California, is given a map showing the distribution of the twenty-one linguistic stocks.

DAVID STARR JORDAN.

AN IGNORED THEORY OF THE ICE AGE.

LOOKING over the recently issued work on 'Geology' by Professors Chamberlin and Salisbury, I was surprised and disappointed to learn that in this voluminous publication of nearly two thousand pages, many of which are devoted to considerations of causes leading up to the ice age, the name of Dr. Marsden Manson is not to be found.

In a work like this, designed for the use of students and general readers, views antagonistic to generally accepted dogmas and pet theories, should, when endorsed by recognized authority, find fair treatment.

Manson's theory of the ice age has been favorably received by some eminent geologists. Thirteen years ago, shortly after Manson's memoir entitled 'Geological and Solar Climates' was first published, I wrote,¹ from an astronomer's point of view, as follows:

Under the above title Dr. Marsden Manson has published a thesis, issued by the University of California, of more than ordinary merit. Geologists tell us that large areas of now densely populated regions of the earth were at one time covered with ice to a depth of many feet. To most scientists the explanations hitherto given, to account for the cause of the so-called *Glacial Epoch*, seem wholly inadequate. Dr. Manson's treatment of the problem is unique, and to many it will appear quite convincing. We do not hesitate to recommend it for careful study to those interested in astro-geological physics.

I now copy, word for word, the last paragraph of a recent paper entitled 'The Causes of the Glacial Epoch,' written by a recognized leader in science. He concludes as follows:

It does seem to the writer that unless it can be shown that the temperature prevailing at the beginning of the glacial epoch could not have been high enough to maintain a cloud envelope, Manson's theory as outlined above must be considered as the most probable among those that have heretofore been suggested, as fulfilling both qualitatively and quantitatively the postulates of the great Ice Age; not excluding of course the probable influence of the agencies claimed by Arrhenius and Chamberlin as the chief ones, but which appear to the writer to be inadequate to account for the phenomena in actual evidence.

Such is the testimony of a geologist of world-wide fame.

J. M. SCHAEFERLE.

ANN ARBOR,
August 30, 1906.

NON-EUCLIDEAN GEOMETRY.

TO THE EDITOR OF SCIENCE: My attention has been called to some quotations from a private letter of mine in an article by Professor George Bruce Halsted on 'The Value of the Non-Euclidean Geometry,' which appeared in the November number of the *Popular*

Science Monthly, 1905. The letter referred to was written by me to the author in answer to a query of his of March 21, 1904, couched in the following words:

I am *curious* to know, if in the face of such a statement as Poincaré's in his review of Hilbert, 'The postulate of Euclid then can not be demonstrated; and this impossibility is as certain as any mathematical truth whatsoever,' you actually still think that you have proved it, or that you have proved that external space is necessarily Euclidean.

In view of the fact that the quotations do not adequately express my views, I beg you for the privilege of being granted some of your valuable space for the publication of my letter in full. The true copy of my letter dated March 25, 1904, follows. The quotations are enclosed in brackets:

My dear Professor Halsted—Your letter of the 21st inst. has just reached me. From its tone I conclude that you are in earnest about the matter, and I am glad to have found in you a man who intends to read the work. The dissertation was written for the purpose of bringing before the mathematical world certain contentions—no matter how seemingly heterodox—for which a scientific basis is claimed to have been laid down in the new treatment and in the new point of view; and, of course, if the claim is not well established, then either the treatment or the point of view is open to criticism—and *fair criticism*, whether favorable, or *unfavorable*, is cordially invited, even solicited. [As to Poincaré's assertion about the impossibility of proving¹ the Euclidian postulate, it is no more than a belief—though an enthusiastic one—never proved mathematically, and in its very nature incapable of mathematical proof,] unless we are certain that space is non-Euclidian. [Poincaré is undoubtedly a great mathematician, perhaps the greatest now living; but his assertion of his inmost conviction, no matter how strongly put, can not pass for mathematical truth, unless *mathematically* proved. His conclusion—shared also by many another noted mathematician, as well as by the founders of the non-Euclidian geometries—can only be based on the fact of the existence of these last geometries, self-consistent and perfectly log-

¹ See No. 32, 'Publications of the Astronomical Society of the Pacific.'

¹ I stand corrected with regard to the germanisms, 'impossibility to prove,' 'impossibility to establish,' which appeared in the original text of the letter.